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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/786,738

02/25/2004

David John DiGiovanni

72-14-2-4-2

3005

7590

08/24/2005

Peter V. D. Wilde  
301 East Landing  
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EXAMINER

HUGHES, JAMES P

ART UNIT

PAPER NUMBER

2883

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

JP

<b>Office Action Summary</b>	<b>Application No.</b> 10/786,738	<b>Applicant(s)</b> DIGIOVANNI ET AL.	
	<b>Examiner</b> James P. Hughes	<b>Art Unit</b> 2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 June 2005.  
 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.  
 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-4 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
 6) ☒ Claim(s) 1-4 is/are rejected.  
 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
 10) ☒ The drawing(s) filed on 25 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☐ All    b) ☐ Some \*    c) ☐ None of:  
         1. ☐ Certified copies of the priority documents have been received.  
         2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Applicant's arguments with respect to claims 1-4 have been considered but are moot in view of the new ground(s) of rejection applied in response to applicant's amendments.

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Onishi et al. (5,581,647) in view of Berkey (2003/0024278). Onishi et al. (5,581,647) teaches a PMD compensation fibers with radially varying indices (e.g. Fig 9c) of refraction wherein it is taught that PMD decreases as the number of turns per meter increase; and that as ovality decreases PMD decreases with a preferable ovality of less than 1%. Following Onishi teaches that a range of 1 to 20 turns per meter may be employed in dispersion compensation fibers. That is, Onishi teaches an optical fibers having an essentially circular core of around 5um core diameter and 125um total diameter (see e.g. Col. 7, ll. 40-50) with a radially varying indices of refraction and a twist of 3 turns per meter. (See e.g., Col. 2, ll. 5-50; Col, 7, ll. 10-65; Figs. 7a-7c)

While Onishi teaches a standard total fiber diameter of 125um (which is a standard for single and multi mode fibers), it is not explicitly taught that the core diameter is greater than

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50um – i.e., a smaller end of what is conventionally considered a multi modal fiber core diameter.

Berkey (2003/0024278) teaches the well known concepts that asymmetric core geometries (i.e. non circular) are believed to be a key cause of polarization mode dispersion (PMD); that single and multi mode fibers typically have an outside diameter of about 125um; that multimode fibers typically have core diameters of 50um or 62.5um; that single and multi mode fibers can benefit from lowered PMD; and that spinning of optical fibers during the draw operation reduces PMD. (See e.g. paragraphs 5-15)

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the teachings of Onishi in a multi mode fiber (e.g. a fiber with a 50um core diameter) because Onishi teaches that this yields beneficial dispersion compensation properties and as is well known – as evidenced by the teaching of Berkey – multi mode fibers can benefit from lower dispersion. One would have been motivated to do so to produce a more efficient multi mode fiber.

3. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Onishi et al. (5,581,647) in view of Berkey (2003/0024278), in further view of Geertman (5,897,680). Onishi in view of Berkey teaches an article comprising a multimode optical fiber as discussed above.

However Onishi in view of Berkey does not explicitly teach alternating the twist between clockwise and counterclockwise twists.

Geertman (5,897,680), herein after referred to as “Geertman”, teaches a low PMD (polarization mode dispersion) optical fiber that comprises at least three twists per meter

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alternating in clockwise / counterclockwise rotations. Additionally, Geertman further teaches that the greater the number of turns per meter the lower the PMD. (See e.g., Col. 4, ll. 25-55 and Col. 5, ll. 25 – Col. 6, ll. 65)

It would have been obvious to one of ordinary skill in the art at the time of the invention to employ alternating in clockwise / counterclockwise rotations in the fiber of Onishi in view of Berkey because as Geertman teaches, such a configuration is beneficial to reducing dispersion. One would have been motivated to do so because reduced dispersion in a fiber produces a more efficient fiber.

### *Conclusion*

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Nishimoto et al. (5,123,076) teaches the well-known concept that radially varying refractive core indices of multi-mode fibers may decrease dispersion. (see e.g., Col. 1, ll. 10-20) Berkey et al. (6,883,351) is the patent resulting from 2003/0024278.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period

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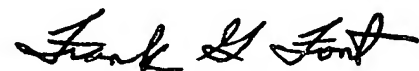

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James P. Hughes whose telephone number is 571-272-2474. The examiner can normally be reached on Monday - Friday 9am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James P. Hughes  
Patent Examiner  
Art Unit 2883



Frank G. Font  
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